

B. In the Claims:

The listing of the claims will replace all prior versions and listings of the claims in the application:

Listing of the Claims:

Claims 1 – 28 cancelled.

29. (original): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact, said second joint member polycrystalline diamond compact serving to form at least a portion of said second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface.

30. (original): A joint as recited in claim 29 further comprising solvent-catalyst metal located in said second joint member polycrystalline diamond compact.

31. (original): A joint as recited in claim 29 wherein said a second joint member gradient transition zone is located between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and wherein said second joint member gradient transition zone has a substrate side and a diamond table side, said second joint member gradient transition zone having both solvent-catalyst metal and diamond therein, and said second joint member gradient transition zone exhibiting a transition of ratios of percentage content of solvent-catalyst metal to diamond from one side of said gradient transition zone to another side such that at a first point in said second joint member gradient transition zone near said substrate side, the ratio of percentage content of solvent-catalyst metal to diamond is greater than it is at a second point in said second joint member gradient transition zone closer to said diamond side than said first point.

32. (original): A joint as recited in claim 29 further comprising chemical bonds between said second joint member polycrystalline diamond compact diamond table and said second joint member polycrystalline diamond compact substrate which tend to secure said diamond table to said substrate.

33. (original): A joint as recited in claim 29 further comprising a mechanical grip between said second joint member polycrystalline diamond compact diamond table and said second joint member polycrystalline diamond compact substrate which tends to secure said diamond table to said substrate.

34. (original): A joint as recited in claim 33 further comprising topographical features on at least one of said substrates, said topographical features serving to enhance said mechanical grip between the substrate and its corresponding diamond table.

35. (original): A joint as recited in claim 29 wherein said second joint member load bearing and articulation surface has a shape selected from the group consisting of concave, convex, arcuate, hemispherical and partially spherical.

36. (original): A joint as recited in claim 29 further comprising a residual stress field said polycrystalline diamond compact, said residual stress field tending to enhance strength of said polycrystalline diamond compact.

37. (original): A joint as recited in claim 29 wherein diamond in said polycrystalline diamond compact has a coefficient of thermal expansion CTE_{Cd} , and wherein said corresponding substrate has a coefficient of thermal expansion CTE_{sub} , and wherein CTE_{Cd} is not equal to CTE_{sub} .

38. (original): A joint as recited in claim 29 wherein in said polycrystalline diamond compact, the diamond has a modulus M_{Cd} , and the substrate has a modulus M_{sub} , and wherein M_{Cd} is not equal to M_{sub} .

39. (original): A joint as recited in claim 29 wherein said second joint member load bearing and articulation surface has an Ra value of between about 0.01 to about 0.005 microns.

40. (original): A joint as recited in claim 29 wherein said polycrystalline diamond load bearing articulation surface is burnished.

41. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member bone fixation portions is shaped to be press fit into a receptacle formed in a bone.

42. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior.

43. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of the exterior that includes features which enhance frictional engagement with a bone.

44. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior, said bone mating surface including a structure selected from the group consisting of metal mesh, porous metal, porous diamond, metal sintered beads, and plasma spray metal.

45. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that includes a surface coating which encourages bone growth against said coating.

46. (original): A joint as recited in claim 45 wherein said coating includes hydroxyl apatite.

47. (original): A joint as recited in claim 29 wherein at least one of said first and said second joint member fixation portions is shaped to permit bone fixation to be accomplished by use of at least one mechanical fastener.

48. (original): A joint as recited in claim 29 wherein said substrate includes at least one metal selected from the group consisting of cobalt, chrome, titanium, tungsten, molybdenum and iron.

49. (original): A joint as recited in claim 29 wherein said substrate includes a metal alloy selected from the group consisting of titanium, titanium aluminum and vanadium, titanium molybdenum hafnium, titanium and nitinol, cobalt chrome, cobalt chrome molybdenum, cobalt chrome tungsten, cobalt chrome cemented tungsten carbide, cobalt chrome cemented chrome carbide, fused silicon carbide and stainless steel.

50. (original): A joint as recited in claim 29 wherein said substrate includes a plurality of substrate layers.

51. (original): A joint as recited in claim 29 wherein said substrate includes at least two distinct substrate layers of different metals.

52. (original): A joint as recited in claim 29 wherein said diamond table includes diamond crystals of at least two different dimensions.

53. (original): A joint as recited in claim 29 further comprising a first joint member load bearing and articulation surface, said first joint member load bearing and articulation surface including a counter bearing material against which said second joint member load bearing and articulation surface polycrystalline diamond may articulate.

54. (original): A joint as recited in claim 53 wherein said counter bearing material includes a material selected from the group consisting of monocrystal diamond, natural diamond, polycrystalline diamond, CVD diamond, PVD diamond, cubic boron nitride, wurzitic boron nitride, ceramic, cobalt-chrome alloy, titanium alloy, nickel, vanadium, tantalum, hafnium, molybdenum, cemented tungsten carbide, niobium, zirconia ceramic, alumina ceramic, polymers, UHMWPE, PEEK, cross-linked polymers and sapphire.

55. (original): A joint as recited in claim 29 wherein said first joint member load bearing and articulation surface counter bearing material is not as hard as said second joint member load bearing and articulation surface.

56. (original): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a load bearing and articulation surface located on said second joint member load bearing and articulation portion, and

a volume of diamond located on said load bearing and articulation portion, said volume of diamond material forming at least a portion of said load bearing and articulation surface.

57. (original): A joint as recited in claim 56 said volume of diamond comprises polycrystalline diamond and wherein said second joint member load bearing and articulation portion comprises a substrate to which said polycrystalline diamond is sintered.

58. (original): A joint as recited in claim 57 further comprising a gradient transition zone between polycrystalline diamond and said substrate.

59. (original): A joint as recited in claim 58 further comprising chemical bonds between said polycrystalline diamond and said substrate.

60. (original): A joint as recited in claim 59 further comprising a mechanical grip between said polycrystalline diamond and said substrate.

61. (original): A joint as recited in claim 60 further comprising topographical features on said substrate, said topographical features serving to enhance said mechanical grip between said substrate and said polycrystalline diamond..

62. (original): A joint as recited in claim 59 wherein said polycrystalline diamond and said substrate comprise a polycrystalline diamond compact.

63. (original): A joint as recited in claim 62 further comprising a residual stress field in said polycrystalline diamond compact, said residual stress field tending to enhance strength of said polycrystalline diamond compact.

64. (original): A joint as recited in claim 63 wherein said polycrystalline diamond has a coefficient of thermal expansion CTE_{Cd} , and said substrate has a coefficient of thermal expansion CTE_{sub} , and wherein CTE_{Cd} is not equal to CTE_{sub} .

65. (original): A joint as recited in claim 63 wherein in said polycrystalline diamond has a modulus MCd , and said substrate has a modulus $Msub$, and wherein MCd , is not equal to $Msub$.

66. (original): A joint as recited in claim 56 wherein said diamond articulation surface has an Ra value of between about 0.5 to about 0.005 microns.

67. (original): A joint as recited in claim 56 wherein said diamond is selected from the group consisting of natural diamond, monocrystal diamond, polycrystalline diamond, CVD diamond and PVD diamond.

Claims 68 – 100 cancelled.